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FISHERIES
MANAGEMENT PLAN PRODUCTIVE

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DEPARTMENT OF RESEARCH AND EDUCATION

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FISHERIES

MANAGEMENT PLAN PRODUCTIVE

The three preceding papers in this series have set forth the principles, the aims and the practical application of the Maryland Management Plan for the rehabilitation of the State's fisheries. The general benefits to the fishermen and the specific benefits to individual species of fish have been indicated. In this, the last article of the series, *actual proof* of the benefits derived from improved management of Maryland fisheries will be shown.

The source of this information is in the individual catch records of two typical Maryland pound-net fishermen who have fished the same stands in the same way for a number of years. The records represent the actual number of pounds of fish caught and sold over a period of years preceding and following change in management of the fisheries, and were taken from duplicate sales-slips in the files of a prominent Maryland sea-food dealer.

The rock and the shad, which were used in the second and third articles of this series as specific examples in showing the operation of management principles, were again used in collecting this information, so that the *actual benefits* of the Plan could be most clearly seen.

Rock are recognized as having occasional years when spawning is particularly successful, and an exceptionally good crop of fish is produced. The effects of management on such broods of fish were outlined in the second article of this series, by comparing the rate of capture of the 1934 and 1940 broods of rock, both of which were "bumper crops." On the basis of sound conservation principles, a theoretical brood of fish was subjected to different rates of fishing, and the effect of controlled fishing was indicated.

The actual facts compiled from the fishermen's sales-slips, somewhat limited data, are even more striking than the theoretical presentation. A four-year period, following the appearance of the 1934 and 1940 broods in the pound net catches, was used to trace the rate of capture of each of these groups of fish. In each of the four years a typical period of fall fishing was taken as an index to the composition of the commercial catch for that season. Records were taken for the first 26 days of fishing following September 16, the period usually ending on October 14 or 15. The number of pounds of large, small, and medium rock

(fixed standards of size set up by the dealer) were recorded, together with the price per pound for each size.

The capture of the broods was traced by starting with the number of pounds of small fish caught in the first year, and then as these fish grew in the succeeding year, the number of "mediums" in the second year. In a similar manner the medium fish grew and became large fish, and the large fish in the third and fourth years indicated what portion

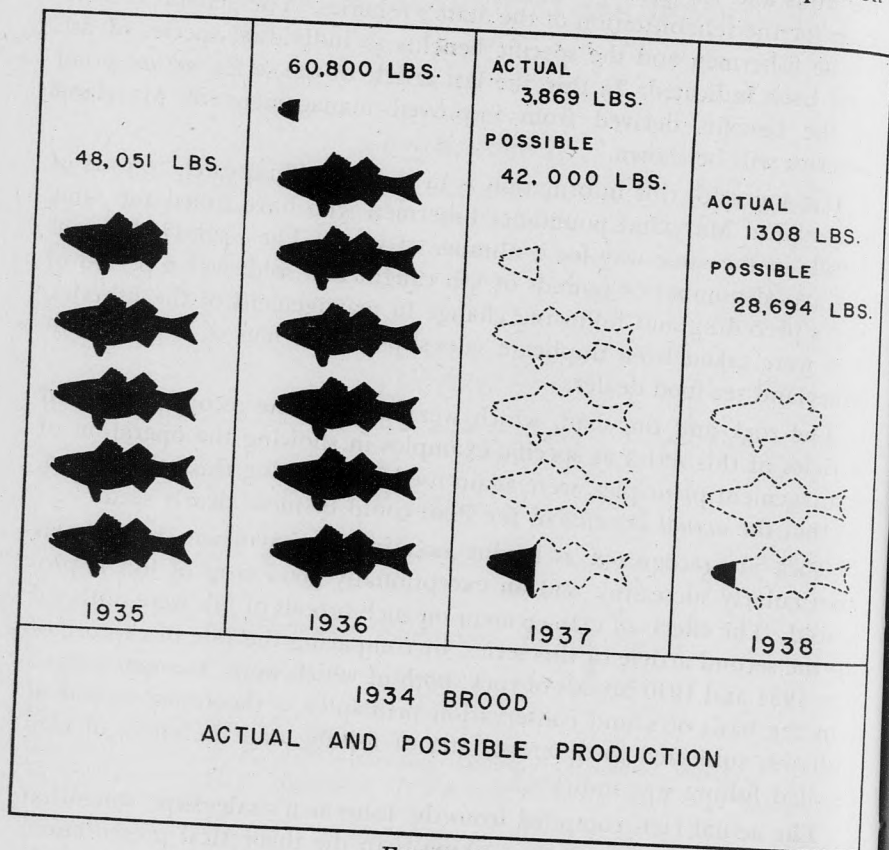


FIGURE 1.

of the brood had escaped capture to reach the larger size. The trend of the individual broods may be recognized, if the quantity of small fish entering the catch each fall is taken into consideration.

The comparison between the 1934 and 1940 broods best can be indicated graphically. The accompanying graph (Figs. 1 and 2) is used to trace the course of managed and unmanaged broods through the four-

year period. Each outline drawing of a fish represents 10,000 pounds; fractions of that amount are represented by fractions of the outline. Solid outlines represent the actual catch, while the dotted drawings used to trace the 1934 brood represent the possible catch if the Management Plan had been operating.

Consider first the 1934 brood, which appeared in the pound nets in the fall of 1934 and is represented by 48,051 pounds of small rock. This group of fish grew rather slowly, and therefore did not reach its peak production until the fall of 1936 when 60,800 pounds of *medium* rock were taken. Fishing in 1936 was so intense, however, that this brood was

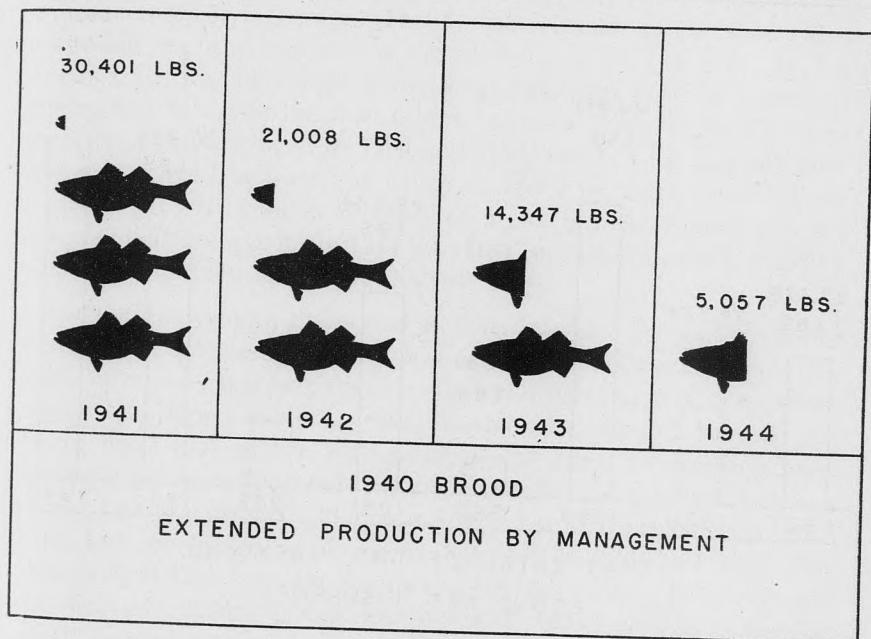


FIGURE 2.

tremendously depleted, and in 1937 only 3,869 pounds survived as large fish. In 1938, the capture of the brood was nearly complete, only 1,308 pounds of large rock being taken.

The 1940 brood, on the other hand, grew somewhat more rapidly, and reached legal size in the fall of 1941. This brood, although definitely a "bumper crop," was considerably smaller than the 1934 brood. Its peak production, reached in 1941, was 30,401 pounds of small fish. This peak, under controlled fishing, dropped only to 21,008 pounds of mediums in 1942, and in 1943 the brood was still represented by 14,347

pounds of large fish. This figure is even more remarkable when it is noted that these fish were unquestionably from *the 1940 brood*, since there were no intervening broods which could have contributed fish of that size to the catch. In 1944, the catch of large fish dropped to about 5,057 pounds. Briefly summarized, controlled fishing produced *more fish of larger size and higher price* from a smaller original stock. From a peak of 60,800 pounds the 1934 brood dropped in a single year to 3,869 pounds, and in another year to 1,308 pounds. Under present management, the 1940 brood, from a peak of 30,401 pounds, produced

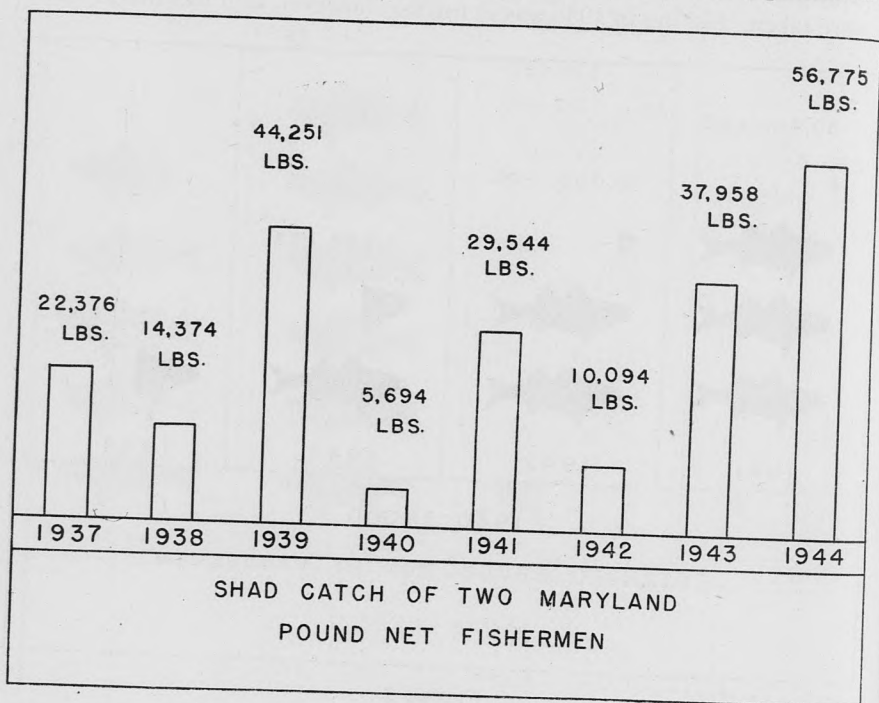


FIGURE 3.

21,008 pounds in the next year, 14,347 pounds in the next, and 5,057 pounds at the end of four years.

Consider the potential wealth in that 1934 brood if it had been properly managed! Had this brood been under advanced management, and had it followed the same pattern as that of 1940, there would have been a yield of 42,000 pounds instead of 3,869 pounds in 1937 (the first year after peak production), and instead of 1,308 pounds in 1938, it would have produced 28,694 pounds. In other words, a total yield of

70,694 pounds would have been obtained instead of 5,177 pounds for the two years following the peak.

The preceding paragraphs have shown the effects of the Management Plan in efficient utilization of a large brood of fish over a period of several years. Another equally important effect of the Plan is the protection of brood stock. Shad offer a particularly good example of this effect. With rare exceptions, each year's brood is directly dependent on the number of fish which reach the spawning grounds. Under management, more shad escape the nets to spawn, return to the sea, and come back the following year to spawn again.

The accompanying graph (Fig. 3) shows trends of the shad catch for pound net fishermen during the period from 1937 to 1944. In this instance, the first twenty-six fishing days following April 15 were used as a typical index for the shad fishery for those years. Periods of temporary recovery occurred in 1939 and 1941, but in each case the next year was marked by a decline which exceeded or nearly equalled the recovery. In 1943 another recovery occurred, but this time it was not followed by a decline, for in 1944 the catch continued upward, reaching a point about five times above the 1942 level.

For the first time in the period of years in which these observations were carried on, *the recovery of one year was not followed by a decline in the next year*. It is here that the effect of management is seen. When young shad, newly hatched, leave the spawning ground, they do not return until four to five years later, so the effect of allowing more spawning fish to escape would not be felt in the fishery for at least four years. The Management Plan was not put into effect officially until 1941, but the fishing level was at low ebb in 1939 and 1940 (the Management Law froze the number of licenses at the 1940 level) and the effect of reduced fishing, together with added growth of the fish which escaped capture, is seen in the 1943 and 1944 catches. Despite the reduction in gear, and the war-time reduction in the number of men operating, the total shad catch for Maryland has gone up during the past two years, and if adequate spawning is provided for, it undoubtedly will continue to rise toward the former high levels of abundance.

As would be expected from the up-turn in the rock and shad catches, the total fish catch for Maryland is definitely increasing. In 1942, the catch was very nearly two million pounds over the total for 1941, the year in which the Plan was officially put into effect. The total for 1943 showed a continued increase, rising to approximately 1,000,000 pounds above the 1942 level. Final and complete reports are not yet available

for 1944, but preliminary records covering January through September give indications of still higher returns, unofficially estimated at more than 2,000,000 pounds above the 1943 catch.

These remarkable increases in the yield of the fisheries indicate that the prevention of overfishing *can and is* restoring Maryland's fishing grounds to their former productivity. Furthermore, overfishing can be prevented without hurting the fishermen. It will not be necessary to review all the principles of the Maryland Management Plan in this discussion. The basic idea of it is simply to maintain the number of fishermen at a level that will assure increased runs of fish and increased income. As the yields increase, additional licenses are to be issued, and more men will enter the industry. The increase in licenses will be controlled, so that *those men already operating will not be injured*, nor will the fish populations be depleted to a point where sufficient brood stock is not left to maintain high levels of production. The point cannot be too strongly emphasized that in the fisheries, as in all wildlife conservation, the preservation of enough brood animals is vital.

The fin fisheries of Maryland are worth approximately half a million dollars annually to the watermen, and will increase in value as the fisheries are restored. About 6,000 people look *directly* to the fisheries for their income. These figures do not include the value in dollars or the number of people *indirectly* dependent on the fisheries, such as truckers, dealers, packers, ice plants, boat yards, and manufacturers of nets and gear, all of whom feel in their business the upward or downward trends of the fin fisheries.

Increased fish production is of particular importance at present in view of war-time food demands. The foregoing facts show conclusively that proper management of this valuable resource is an effective method in the production and maintenance of the largest possible yields of these essential foods.

The long-term aspects of improved yields in the fisheries are also of extreme importance. Additional pounds and dollars will not only mean higher incomes and better living for the fishermen, but will be reflected throughout the State. Post-war developments in refrigeration and transportation promise to enlarge the market for Maryland sea-food by providing new and profitable outlets to absorb the increased and continuing high levels of production which are expected. The Chesapeake Bay has long been famous for its production of sea trout, croakers, rock, white perch, and river herring, and continued operation of the present Management Plan gives great promise of bringing it to an even higher position among the nation's sea-food centers.